

On supposed Stridulating-Organs of *Steatoda guttata*, Wider., and *Linyphia tenebricola*, Wider. By F. MAULE CAMPBELL, F.L.S., F.Z.S., F.R.M.S.

[Read June 17, 1880.]

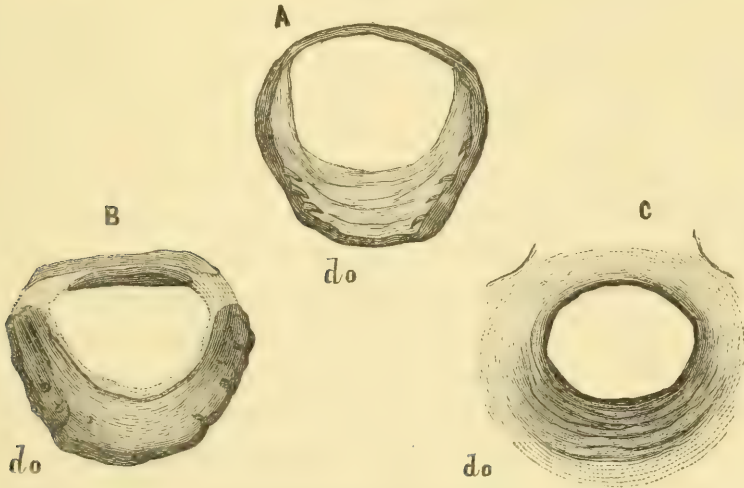
PROFESSOR WESTRING (Naturhist. Tidsskrift, vol. iv. 1842-44, p. 359, and vol. ii. 1846-1849, p. 342, and 'Araneæ Suecicæ') discovered stridulating-organs in the following Spiders, viz. :—*Assagena phalerata*, Panz., *Theridion hamatum*, C. Koch, *Steatoda bipunctata*, Linn., *S. castanea*, Clk., *S. albomaculata*, De Géer, and *S. guttata*, Wider. In 'Araneæ Suecicæ' (1862) Prof. Westring writes of the *Assagena phalerata* (p. 175) "Femina organis iis caret;" but does not mention the female of the other species as *not* possessing the stridulating-apparatus. Throughout, however, he refers only to its presence in males, as when speaking of the male *Steatoda bipunctata*, he adds :—"hic sexus similiter ac ♂ *Th. serratipedis, hamati, castanei, guttati et albomaculati* stridere potest. Mas descriptus post captivitatem minus libenter sonum reddit, quare, si hunc audire velles, animalculum statim ut capitur inter digitos ad aures est tenendum"*. Mr. Darwin ('Descent of Man,' 2nd ed. p. 273) and Professor Wood-Mason (Trans. Ent. Soc. 1877, p. 282), apparently quoting Westring, state that the apparatus consists "of a serrated ridge at the base of the abdomen, against which the hard hinder part of the thorax is rubbed; and of this structure not a trace could be found in the females." The Rev. O. P. Cambridge ('Spiders of Dorset,' vol. i.) refers to these organs as a distinction of species in *Assagena phalerata*, Panz., *Steatoda bipunctata*, Linn., *S. guttata*, Wider., and *S. sticta*, Cambr. He describes certain of them as possessing, in "the fore extremity of the abdomen, a sort of socket, serrated or denticulated on its upper edge; and into this the hinder extremity of the cephalothorax fits."

I am indebted to the last-named araneologist for specimens of male and female of *Steatoda guttata*, Wider., and *S. bipunctata*, Linn. In the male of the former the socket is a complete ring with some strong chitinous spurs on the inside of its external edge (fig. 1, A), which is also roughly serrated. That of the female is divided into two parts, the inferior being the smallest, while the superior, as in the male, is the deepest. In the female

* I have had no experience of this.

(fig. 1, B) there are no spurs; the inner edge, however, is undulated, and in points becomes angulated, while a little below are stiff hairs on small protuberances. The chitinous thoracic extension of the male is marked on its superior surface with many fine parallel transverse grooves, which are absent in the female (fig. 1, C); while in the same position on both sexes are several

Fig. 1.



Stridulating-organs of *Steatoda (Theridion) guttata*, ♂ and ♀.

A. Male. View, from above, of chitinous ring or socket attached to abdomen covering the union with thorax. *do*, dorsal surface.

B. Ditto of the female. *do*, dorsal surface.

C. View, from above, of chitinous extension of thorax; female. *do*, dorsal surface.

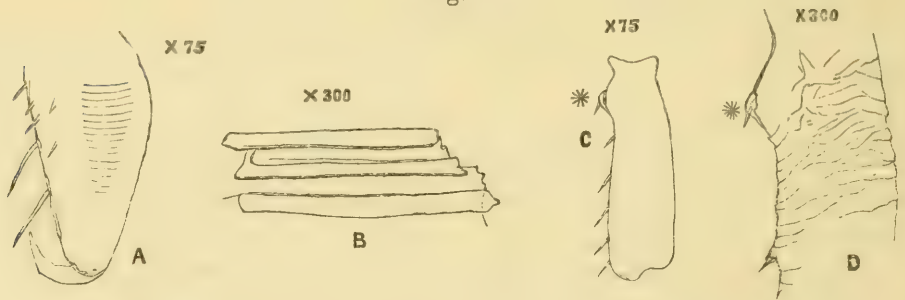
ridges, which are less numerous in the male. It is quite likely that individuals may vary in details; but it appears that the female of *Steatoda guttata*, Wider., has, as well as the male, organs adapted to stridulation.

I have also examined both sexes of *Steatoda bipunctata*, Linn., and find that the socket of the male is much shallower than those of the male and female of the last-named species. The inside of the external edge is rough, and the sides are lined with a row of bristles seated on prominences; and the only opposing surface is a spinate ridge on the base of the thorax, which has no chitinous extension covering the abdominal union. In the female there is no trace of these organs.

In the same paper already quoted (Trans. Ent. Soc. 1877, *Mygale stridulans*), Prof. Wood-Mason describes the totally different sound-producing apparatus in male and female of "*Mygale stridulans*" of Assam, "on the inner face of the basal joint of the

palps" and "the penultimate joint of the chelicerae." The organs which I venture to call stridulating in both sexes of *Linyphia tenebricola*, Wider. (= *Linyphia terricola*, Blackw., = *Linyphia tenuis*, Blackw. †), are also seated on the falces and palpi, but are of different structure. I observed them while examining the palpal organs with a $\frac{3}{4}$ objective, and defined them with higher powers as follows:—On the outer side of the basal joint of each falx are about twenty parallel transverse chitinous bands, placed so that their inferior edges are free (fig. 2, A), as is easily seen in section (fig. 2, B). The effect, when viewed from the front, is that each falx has a distinctly serrated outer edge, which becomes more decided towards the base. The opposing surface is that of the humeral joint of each palpus, which is marked with a more or less regular series of curved grooves, deep enough to give the appearance of serration on its sides under a $\frac{2}{3}$ objective. On the inside of this joint close to its base is a curved enlargement, and on the top a prominent, horny, somewhat triangular, knob-like plate (fig. 2, C* and D*) with a rounded apex. This differs in form, size, elevation, and position from the chitinous prominences usually seen in connexion with spines, of which there is one near its side, but of which in some individuals it is independent.

Fig. 2.



Stridulating-organs of *Linyphia tenebricola*, Wider., ♂.

- A. Right falx as viewed obliquely from the right side.
- B. Part of three stridulating-bands. The broken edge is to the reader's right.
- C. Humeral joint of left palpus, the spines being omitted, except those on the inside. * Horny plate.
- D. Basal portion of third joint, showing at * the horny plate.

These organs persist in all adult members of both sexes of this species; but those on the palpi of the females are not so highly developed, the chief difference being the size of the enlarge-

† See Thorell, 'Remarks on Synonyms of European Spiders,' p. 66; and Cambridge, 'Spiders of Dorset.'

ment at the base of the third joint. When confined in a small glass tube, these Spiders often move their palpi backwards and forwards with a slight rotatory motion in such a manner that the horny plate crosses the bands on the falces; but hitherto I have been unable, even with the aid of a microphone, to detect sounds in connexion with these movements.

The bands appear to be a modification of grooves which are to be found on the falces, and which are similar to those already mentioned on the palpi, and are also present, without any specialized form, on the falces of *Linyphia clathrata*, Lund, whose habits resemble those of the *L. tenebricola*, Wider. They are sufficient to give an appearance of slight serration; but up to the present I have been unable to find any opposing surface which could be used for stridulation in *Linyphia clathrata*.

The absence of specialized stridulating-organs in most Araneæ does not, however, imply that they are mute. It is a common practice with many to rub the falces against the maxillæ; and were the serrated edge of these latter found in another part of the body, similarly opposed to a hard toothed chitinous surface, it is most likely they would be pronounced stridulating-organs.

On certain Glands in the Maxillæ of *Tegenaria domestica*, Blackwall. By F. MAULE CAMPBELL, F.L.S., F.Z.S., F.R.M.S.

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DR. A. WASSMANN, in "Beiträge zur Anatomie der Spinnen" (Abhandl. aus dem Geb. der naturwiss. Hamburg, Erster Band, 1846), and M. Felix Plateau, in his "Recherches sur la Structure de l'appareil digestif, et sur les Phénomènes de la Digestion chez les Aranéides dipneumones" (Bull. Acad. Roy. de Belgique, sér. 2, t. xlv. 1877), describe a gland which is seated in the labrum; but they, like all other writers to whom I have referred, make no mention of those which I am about to describe. In the *Tegenaria domestica* the apertures are on the inner side of the median line of the upper face of each maxilla, where they commence to incline towards the mouth, as seen in woodcuts figs. 1 and 2, A. The external form consists of a ring (figs. 1 and 2, B), .005 millim. in diameter (average outside measurement) in adults, enclosing a raised disk, in the centre of which is the opening leading to a shallow cavity, from which runs the